



# Cost Estimate Validation Process

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# Project Estimating 101

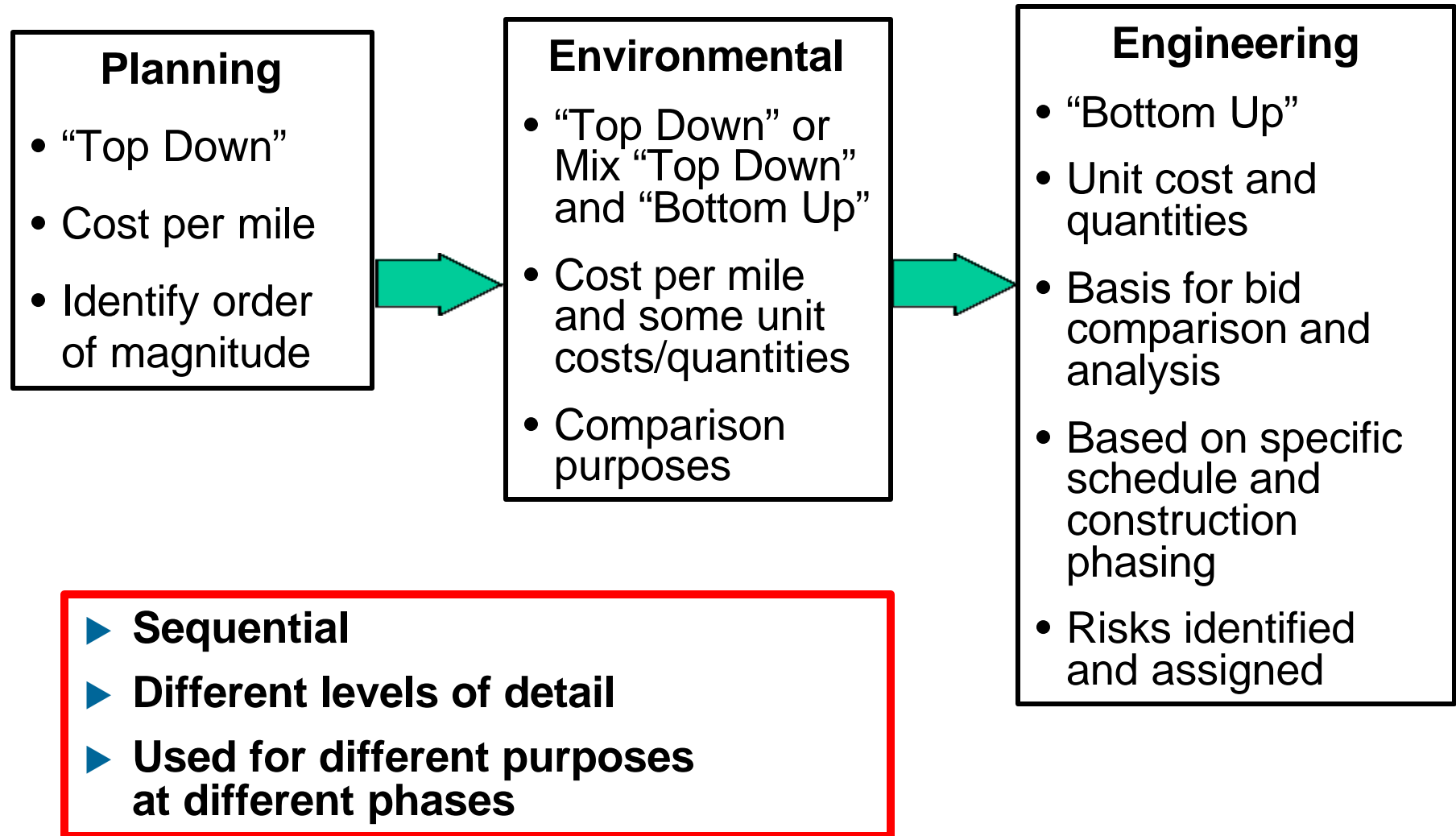
Presentation will cover:

- ▶ Variability of cost
- ▶ How are estimates usually done?
- ▶ What do we need to do to get a good estimate?
- ▶ Need a reliable cost estimating/validation process
- ▶ Must evaluate risk and variability using statistical (probability) methods

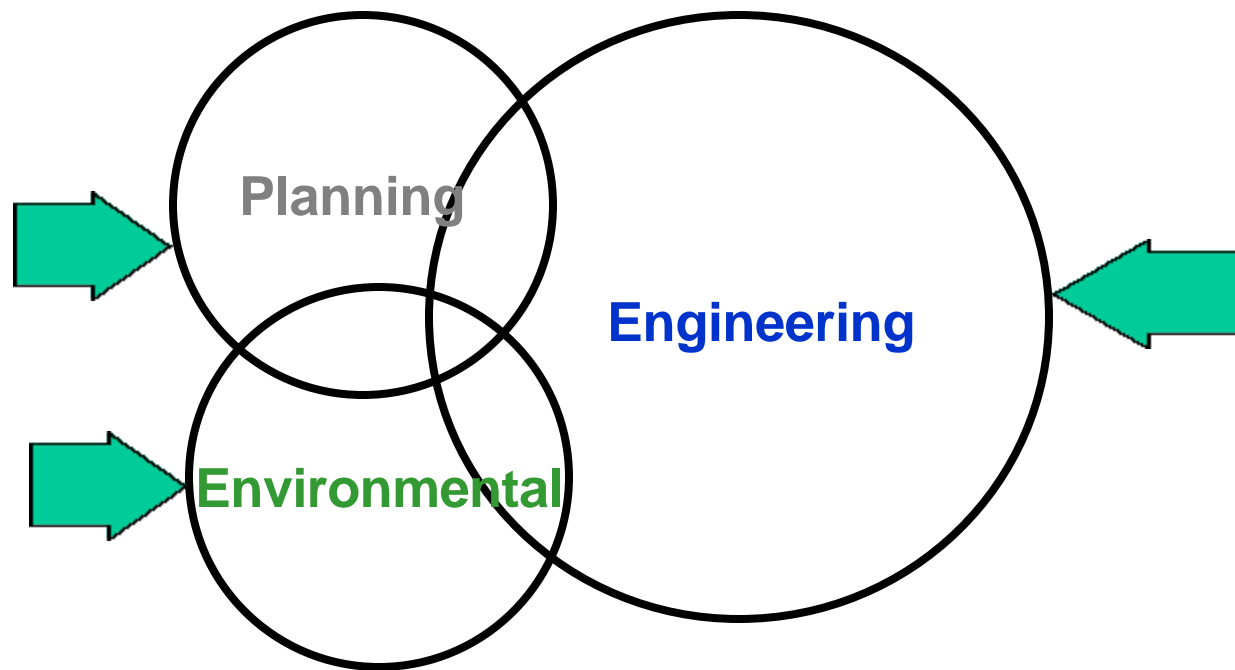
# Variability of Cost

- ▶ Actual project cost is subject to many variables, creating a range of “probable projected cost.”
- ▶ Any single cost number represents only one possible result, depending on the variables and assumptions.
- ▶ Variables are not all directly controllable or absolutely quantifiable.
- ▶ Cost estimating must consider probabilities in estimating cost, using a recognized, logical and tested process.

# How are Estimates Usually Done?



# How Do We Get a Good Estimate?



1. Integrate planning, environmental and engineering processes
2. Advance high-risk engineering items
3. Identify and quantify items that also affect project cost:
  - Politics
  - Environmental
  - Schedule and phasing

# Two Key Actions

- ▶ First:

Develop a cost estimating and validation process to ensure that cost estimates are reasonable, defensible and sustainable.

- ▶ Second:

Implement project and program management systems to ensure on-time, on-budget delivery of WSDOT mega-projects.

# Cost Estimate and Validation Process

- ▶ WSDOT is now developing a uniform Cost Estimate Validation Process (CEVP)
  - Peer review panel of experts (national)
  - Review project cost estimates
  - Identify high-risk project items
  - Develop protocols to enhance estimating practices
  - Introduce risk, variability, and statistical probability into estimating

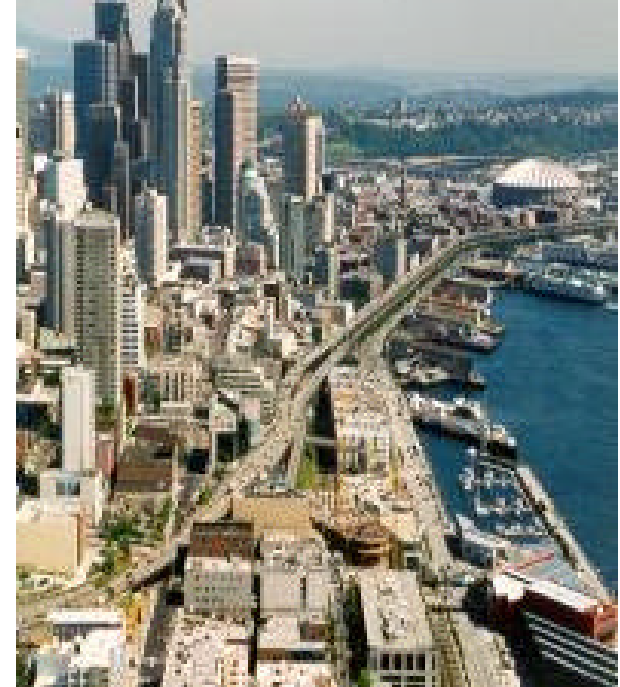
# Introduction

- ▶ Emerging national and international strategies about the management of cost, schedule and risk for complex projects
- ▶ Management systems:
  - ▶ relationship contracting (alliancing)
  - ▶ dispute resolution
  - ▶ risk mitigation
- ▶ Need to add cost estimate validation



# Key Project Requirements

- ▶ Public understanding and acceptance of the project – “buy-in,” support
- ▶ Funding – availability, stability
- ▶ Ability to set a realistic budget and schedule
- ▶ Ability to meet a realistic budget and schedule



# Key Factors

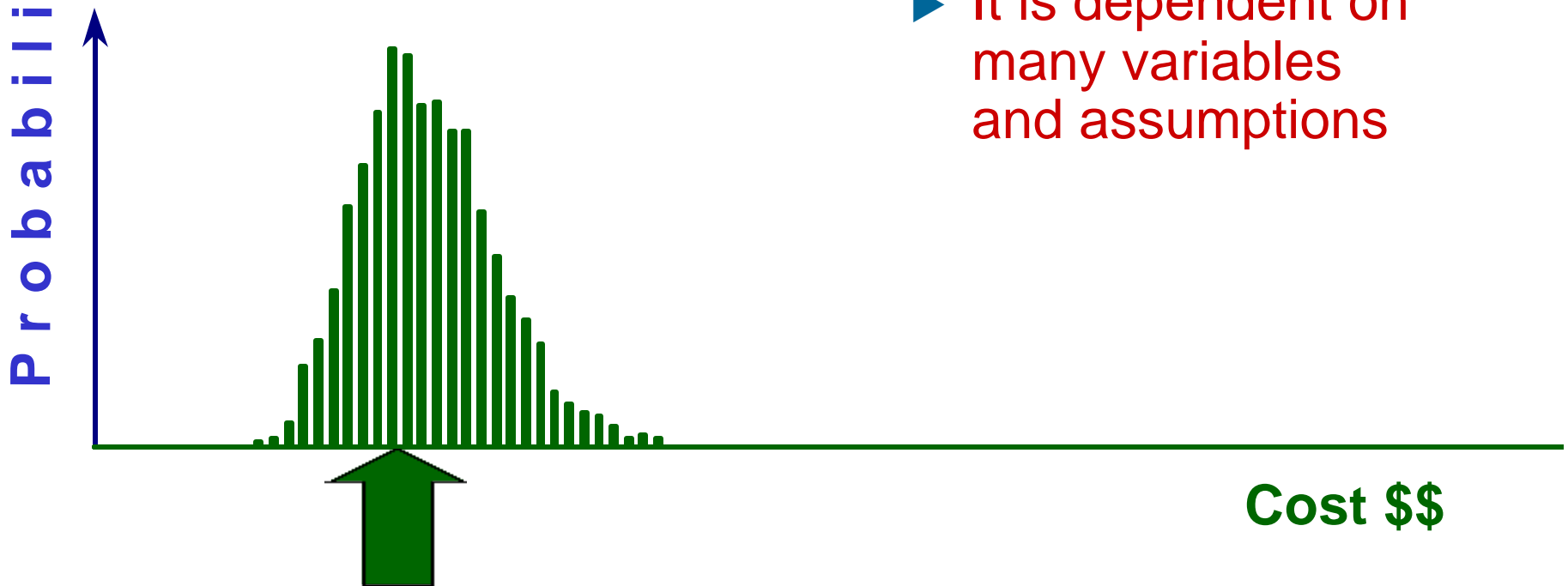
- ▶ Geological/physical
  - ▶ Technical/configuration
  - ▶ Constructability
  - ▶ Funding and budgets
  - ▶ Stakeholders
- ▶ Contracting environment
  - ▶ Public support
  - ▶ Random/risk events
  - ▶ Political (transitions)
- ▶ Management system
  - ▶ Contractual approach
  - ▶ Personnel (capability and continuity)
  - ▶ Leadership, teamwork



# Developing Cost Ranges

Expect a range of possible costs

Probability of a  
particular cost



**Most probable construction cost**

- ▶ Any cost number represents only one possible final result
- ▶ It is dependent on many variables and assumptions



# Risk and Variability – A Process

- ▶ Risk and variability always exist in large, complex infrastructure projects
- ▶ A significant number of projects have overrun budget and schedule by what have been called "unforeseen" or "unanticipated" events
- ▶ What does it take to "anticipate" these "unforeseen" events?
- ▶ Time? Expertise? Money?  
A structured risk-mitigation process?

# Example: London – Jubilee Line Transit

- ▶ The project was:
  - 2 years late
  - \$1.9 billion over budget (~25% overrun)
- ▶ Report of the Government Advisors
  - “Time and cost overruns could have been minimized **with a more established strategy at the very beginning of the project**”.
  - “London Underground ...**lacked the strategy, structure and continuity of management** to ensure the delivery of a working railway.”

# Risk Identification Workshops

- ▶ Risk workshops allow the project to evaluate and mitigate potential problems
- ▶ Risk workshop process:
  - ▶ Identify potential impacts
  - ▶ Estimate probabilities for each impact
  - ▶ Risk = impact x probability
  - ▶ Develop risk reduction strategies
  - ▶ Determine cost/benefits for these strategies
  - ▶ Decide a prudent course of action

# Complex Projects

- ▶ Big projects are consistently more complex than initially envisioned